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ESCAPE FROM FREEDOM: CHOOSING NOT TO CHOOSE IN PIGEONS

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Preference for the availability of food-reinforcement alternatives was investigated with Rachlin and Green's (1972) concurrent-chains self-control paradigm. The terminal link of one chain made available a choice between immediate access to food for *T* seconds and delayed access to food for 4 seconds. The terminal link of the other chain provided only delayed access to food. When *T* was reduced to .25 seconds, pigeons began to select the delayed-access key in both terminal links. Even so, the pigeons strongly preferred constraint over choice. This effect could not be accounted for by differences in the actual amount of food obtained in the terminal links, by avoidance of the immediate-reinforcement key when not presented as part of a choice, or by avoidance of a multi-key terminal link. Rather, constraint was preferred over freedom. Apparently, the preference for choice is determined by the particular type of choice offered.

Key words: choice, self control, concurrent-chain, pigeons

Freedom, it has been said, can be characterized by the availability of alternatives (Catania, 1975). In that sense, how much organisms value freedom should be reflected in how much they prefer the availability of alternatives. Catania (1975) showed that pigeons prefer to have a choice even when the edible consequences of having or not having a choice are equivalent. Similar results have been shown for rats (Voss & Homzie, 1970). Yet many persons believe that, with humans at least, the availability of alternatives is not always preferred (e.g., Atkins & Lockard, 1976; Fromm, 1941).

These different viewpoints on the value of freedom may, as Catania (1975) suggests, reflect social or cultural factors unique to humans. Another possibility is that certain kinds of choices are preferred, while others are not. Lockhart (1979) pointed out that in Catania's study the preferred situation was a choice between two equally desirable alternatives. It is difficult to make a "mistake" in such a situation, and there may be phylogenetic reasons to prefer it (Catania, 1975). But imagine situations that offer a choice between a particularly self-defeating alternative and a more desirable one. These choices may not be preferred (cf. Lockhart, 1979). Avoiding choices that offer tempting but destructive alternatives could easily have phylogenetic importance. The present experiments examined preference for choice under such circumstances.

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GENERAL METHOD FOR ALL THREE EXPERIMENTS

Subjects

Three adult female white Carneaux pigeons were maintained at about 80% of their free-feeding weights. Each bird had previously served in several operant experiments on fixed-interval schedules.

Apparatus

Sessions were conducted in a standard two-key chamber with the food hopper midway between them. Keys could be lit white, red, green, yellow, or blue. Pecks on a lit key at a minimum force of .14N operated the key and produced a feedback click. Throughout the study, pecks on a darkened key produced no consequences. No houselights were used. The food hopper was lit during the delivery of mixed grain. White noise through a speaker and a ventilating fan provided masking noise. The entire chamber was enclosed in a sound-insu-

lating shell. Scheduling and recording were arranged by standard electromechanical equipment in an adjoining room.

Procedure

These experiments used Rachlin and Green's (1972) concurrent-chains ("self-control") paradigm. Each session had 50 trials, 20 forced trials followed by 30 free trials. Sessions were held daily unless subjects were overweight.

During free trials, both keys were white in the initial links. A single peck on either white key darkened both keys for one second. After the blackout, one or both of the keys was again illuminated to start a terminal link. If the peck in the initial links had been on the white key that gave access to the choice terminal link, one key became red and the other green in the terminal link. A single peck on red produced immediate access to the food hopper for T sec followed by an intertrial blackout. A peck on green produced a 4-sec blackout, then 4 sec of food, and a 15-sec intertrial blackout. To equate trial lengths in the two chains, the intertrial blackout following pecks on red was 23 sec minus the length of hopper access (T).

A peck in the initial links on the other white key produced the same sequence as above, except that only the green key and its correlated reinforcement conditions were presented in the following terminal link. Following the intertrial blackout, both keys were once again white, reinstating the initial links.

Forced trials differed from free trials in that only one key was lit in the initial link. Over the 20 forced trials, each chain was presented randomly 10 times.

The first experiment was designed to establish responding for the immediate reinforcer on the red terminal-link key and then gradually to eliminate responding on the red key by reducing the magnitude of the reinforcer. The preference for terminal-link choice in these conditions could then be ascertained.

EXPERIMENT I

Method

The value of T (the duration of access to food following a peck to red) was set initially at 2 sec, then 1 sec, .5 sec, and finally .25 sec for the rest of the experiment. At .25 sec subjects virtually never succeeded in obtaining food from the hopper. Throughout the early phases of the experiment, the left white key in the initial links provided entry to the choice terminal link. This was switched to the right white key for the final 20 to 25 sessions. In the choice terminal link, the red (immediate-reinforcement) key was always on the left; the green (delayed-reinforcement) key was always on the right. Table 1 shows the number of sessions in each condition.

Results and Discussion

At high values of T, preference for the choice situation was generally very strong and selection of red given the choice of red or green was universal (see Table 1). As the value of T decreased, subjects began to prefer constraint and responding to red in the forced trials eventually began to deteriorate (see Table 1).

When $T = .5$ sec, all three subjects continued to peck red when forced to choose between red and green, but selected the constraint situation in free trials. This is understandable since pecks on red when $T = .5$ sec only rarely yielded food and thus at a point 1 sec removed from food (that is, in the initial links) the relative value of the constraint situation would be higher (Rachlin & Green, 1972). However, even when subjects finally began consistently to peck green on trials when they were forced to choose between red and green, the preference for constraint continued. In the final phase, there was only one peck to red out of 200 forced presentations of red and green over the last 20 sessions for both Subjects 76 and 2590, yet preference for constraint in the terminal link remained. In other words, the actual edible consequences of selecting either chain were virtually identical, yet subjects avoided choice nearly 100% of the time (see Figure 1).

Experiment I contained several potential problems. First, the positions of red and green were fixed and positional preference might explain the results. Second, selection of constraint may have simply reflected a temporary inflexibility in behavior characteristic of concurrent fixed ratios. With additional trials (once subjects began to peck green given red and green) preference for constraint might have declined. Third, the birds may have been avoiding a situation where they sometimes pecked red, rather than avoiding the choice of red and green. This possibility exists because the edible consequences of the two chains were not absolutely identical. Subjects still occasionally

Table 1

Preference for red given a choice of red and green in the terminal link, and pecks on the constraint initial-link key in each condition in Experiment I.

Condition	Subject	Number of Sessions	Average sum of pecks on red in 10 red/green forced trials		Average sum of pecks on constraint initial-link key for 30 free trials over the last 7 Sessions
			Total	Over the last 7 Sessions	
$T = 2$ sec	76	68	10	10	0
No-choice	499	75	10	10	0
key on	2590	60	10	10	0
the right					
$T = 1$ sec	76	15	10	10	0
No-choice	499	16	10	10	0
key on	2590	24	10	10	25.9
the right					
$T = .5$ sec	76	10	10	10	28.1
No choice	499	18	10	10	29.0
key on	2590	10	10	10	30.0
the right					
$T = .25$ sec	76	25	9.6	8.7	29.0
No choice	499	26	9.6	8.9	28.7
key on	2590	20	5.6	.3	30.0
the right					
$T = .25$ sec	76	24	.9	0	29.6
No choice	499	20	1.6	.3	29.6
key on	2590	25	.4	0	29.4
the left					

T = duration of food reinforcer following a peck to red in a terminal link.

pecked red in forced trials. If subjects had selected the choice terminal link, they presumably would have pecked red (if only rarely) and failed to get food. Thus, the constraint terminal link might have been preferred because of a slightly richer schedule of reinforcement. These problems were dealt with in Experiment II.

EXPERIMENT II

Method

The general method in the first condition of Experiment II was identical to the last condition in Experiment I except that the locations of red and green in the terminal links were randomized from trial to trial. Latencies during forced trials were collected on the final five sessions of this condition to assess whether pecks to green were slower in the presence of red than in its absence. After the first condition (of 26 to 33 sessions) the constraint initial-link key was switched from left to right for Subject 2590 (for 20 sessions). In a final condition (17 to 22 sessions) the percentage of pecks on red in red/green forced trials (X) was calculated for each subject before free trials were run. In the free trials, pecks on the constraint initial-link key randomly produced red-only X% of the time. Thus, if a subject pecked red once over the 10 red/green forced trials, then 10% of constraint initial-link pecks in free trials produced red, not green. The logic of this condition assumes that the probability of pecking red in the red/green forced trials accurately predicts the probability of pecking red had the bird selected the choice terminal link during free trials. Assuming this, the condition equates absolutely the edible consequences of the two chains. During this condition, the constraint initial-link key was on the right.

Results and Discussion

As Figure 2 shows, in the first condition each subject continued to prefer constraint. Initially, pecking red increased (presumably because of a positional preference produced by the previous condition), but then it again decreased to very low levels. Subject 2590 tracked the constraint initial-link key, showing that preference for the constraint key was not merely positional. In the final condition, this

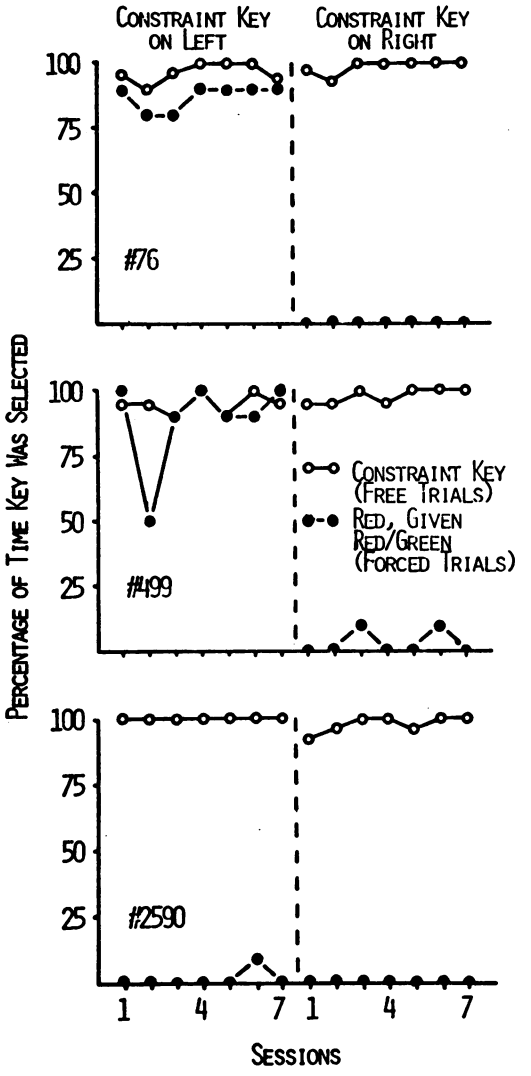

Fig. 1. Individual preference for red (in terminal link of forced red/green trials) and pecks to constrain initial-link key (in free trials) over the last seven sessions of the last two conditions of Experiment I ($T = .25$ sec).

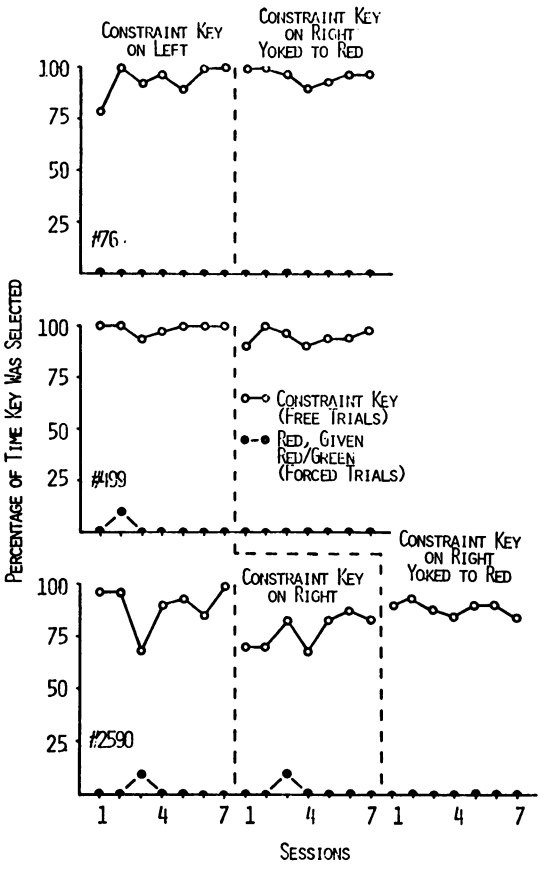

Fig. 2. Individual preference for red (in terminal link of forced red/green trials) and pecks to constraint initial-link key (in free trials) over the last seven sessions of each condition in Experiment II.

preference continued. Birds 499 and 76 tracked the constraint initial-link key from left to right, despite the identical edible consequences of the two chains. Subjects 499 and 76 both showed some tendency to peck red (.6 and .3 peck per 10 trials over the entire condition, respectively) and thus experienced the altered contingency in the constraint terminal link, yet they continued to prefer it.

The latency data collected in the first condition of Experiment II showed that the avoidance of choice was not based on differential temporal efficiency. The average latency of pecks to green in the red/green forced trials was 1.13 sec and 1.15 sec in green-only forced trials.

It appears that preference for constraint is strong, persisting for many sessions, despite a low probability of selecting the undesirable alternative (the red key) even when it is present. Further, this preference cannot be easily accounted for by potential differences between the programmed consequences on the two keys or by temporal efficiency. At least one possibility remains. Perhaps the mere presence of another key (red) was somehow not preferred. The aversiveness of a second key might not entail latency differences and a more adequate control condition for this possibility was devised in Experiment III.

EXPERIMENT III

Method

The conditions in this experiment were identical to those in the first condition of Experiment II, with the following exceptions. The green key was changed to yellow and the red key to blue. Pecks on blue were recorded but produced no food and did not terminate the trial. Thus, one initial-link key produced a food key (yellow) and a no-consequence key (blue). The other (constraint) initial-link key produced only yellow (cf. Catania, 1975). In the first phase the right white key was the constraint initial-link key; in the second phase it was the left white key.

Results and Discussion

As Table 2 and Figure 3 show, subjects tended to show positional preferences. The blue key was pecked initially, but responding rapidly disappeared. Two subjects initially preferred constraint, one did not. When the constraint initial-link key switched from right to left, two subjects continued to peck the same key. One subject showed variable responding. Thus, it appears that the mere presence of a second key cannot account for the effects shown in Experiments I and II since the type of alternatives in this experiment did not produce a consistent preference.

GENERAL DISCUSSION

The preference for free choice over constraint when the edible consequences are identical appears not to be universal. Some types of choices have been shown to be preferred (Catania, 1975), but the present experiments show that choice is not preferred when access to grain is virtually eliminated in one of the alternatives in the choice terminal link. Control experiments preclude the possibility that this effect might be due to differential edible consequences, temporal efficiency, or the mere presence of a second key.

If the findings of the present study are sound, they may provide a basis for the view, held by many, that "freedom" is not always preferred. Clinicians seem particularly likely to hold such views (e.g., Fromm, 1941), perhaps because clients frequently face undesirable alternatives to choose among. Further, self-defeating behavior in these choice situations need not actually occur for them to be aversive (this may be one reason such choices have been termed "intrapsychic" conflicts—because the overt behavior with regard to them does not predict their valence).

The range of choices which are preferred or not remains to be investigated, but some speculation may be permitted. The type of choices that might have evolutionary consequences are ones where there is some tendency to select a self-defeating alternative over a beneficial one. There might be a decrease in reproductive success of those preferring the availability of such alternatives.

This analysis harkens back to the concept of the aversiveness of conflict (Miller, 1959). Studies that have related self-control to conflict (e.g., Hearst & Sidman, 1961) have not been able to separate avoidance of conflict from avoidance of negative aspects of the conflict situation (e.g., shock). The present study has shown that some choices are indeed not pre-

Table 2

Pecks on the constraint initial-link key and the number of pecks on the no-consequence key in each condition in Experiment III.

Condition	Subject	Number of Sessions	Average sum of pecks on the no-consequence key over 10 forced trials		Average sum of pecks on constraint initial-link key for 30 free trials over the last 7 Sessions
			Total	Over the last 7 Sessions	
No-choice	76	16	1.7	0	.4
key on	499	15	4.4	.1	29.4
right	2590	18	4.2	.6	29.3
No-choice	76	31	.3	.6	29.6
key on	499	26	1.0	.3	0
left	2590	27	.5	.3	11.6

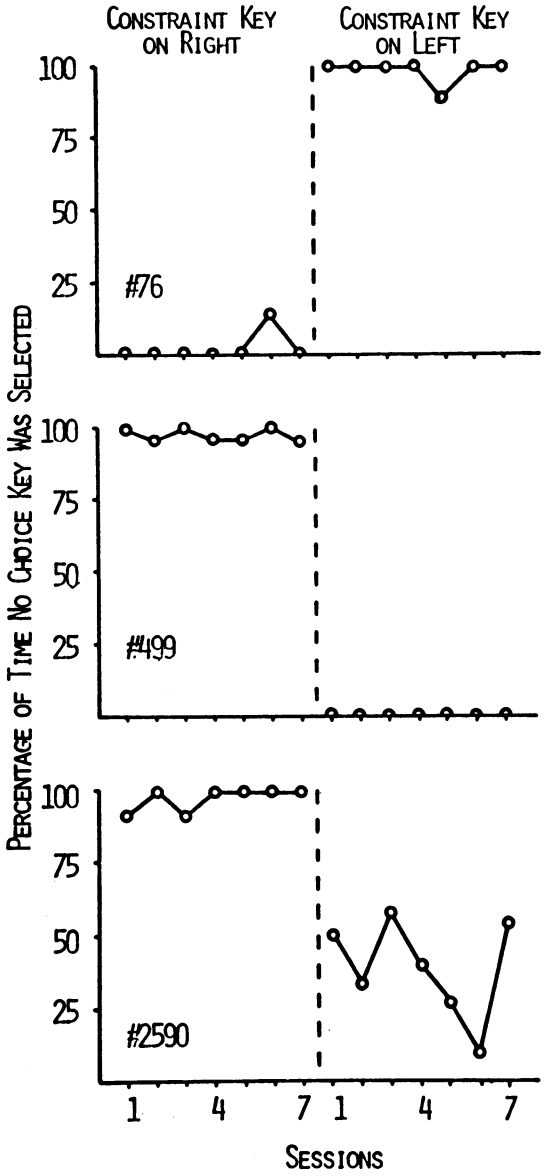

Fig. 3. Individual pecks to constraint initial-link key (in free trials) over the last seven sessions of each condition in Experiment III.

ferred, quite apart from the separate effect of the specific negative element of these situations.

It may be worthwhile to distinguish between the availability of alternative operants and their actual emission. The experimenter may make available a "choice" to which the organism responds as if there were no alternatives. Preference in such situations may not speak to the preference for choice when the various alternatives are each selected with some frequency. One could say, for example, that the present study showed that the presence of red, rather than the choice between red and green, was aversive. If one is using choice to describe subjects' behavior, then this may be true. If choice refers to the experimental arrangements, then the presence of red (with green) defined the "choice" situation.

Along these lines Catania's study might be summarized as follows: in discrete-trial, concurrent-chains procedures, if the probability of choosing *a* or *b* given a choice of *a* and *b* is about equal then the organism will prefer the choice of *a* and *b* over either alone. The present results might be phrased as follows: in discrete-trial concurrent-chains procedures, if the probability of selecting *a* given a choice of *a* and *b* is nearly zero then the organism will prefer *b* alone over the choice of *a* and *b*.

This analysis is clearly limited by temporal boundaries (Rachlin & Green, 1972). Further, Experiment III shows that some significant cost (e.g., termination of the trial without food) apparently needs to be associated with the alternatives. Nevertheless, it suggests some intriguing possibilities. For example, suppose one arranges a choice between two qualitatively distinct consequences of about equal value (say, a large amount of food with some shock versus a small amount of food). The concurrent availability of these two alternatives would then be expected to be preferred over either alternative alone, despite the qualitatively negative aspect of one of the alternatives.

It appears that freedom must actually be exercised to be preferred over constraint (a point not without human implications). If not valued sufficiently, the mere physical presence of alternatives seems to lead to indifference or to active avoidance.

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